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Smoking and stroke: a causative role

Heavy smokers with hypertension benefit most from stopping

Stroke remains the third leading cause of death in most Western countries and is second only to myocardial infarction as a cause of cardiovascular death. Many epidemiological studies have established cigarette smoking as an important risk factor for stroke. Until recently, however, this relation was based on observational studies and the effects of smoking were thought to be synergistic with hypertension, diabetes mellitus, glucose intolerance, age, hypercholesterolaemia, and pre-existing cardiovascular disease.[1] Now we have definite evidence that smoking itself has a direct causal effect on stroke.

The relation between smoking and atherosclerosis was observed as early as 1908 by Buerger, who noted severe distal ischaemia among young male addicted smokers.[2] The earliest report associating stroke and extracranial arterial disease is credited to Gowers, who in 1875 showed left carotid artery occlusion in a patient with right hemiplegia and loss of sight in the left eye.[3]

The Framingham Heart Study was among the first to assess these the relation of smoking to type of stroke, number of cigarettes smoked, and the effect of stopping.[4] It concluded that smoking made a significant independent contribution to the risk of stroke generally and to brain infarction specifically. The relative risk of stroke in heavy smokers (>40 cigarettes/day) was twice that of light smokers (<10 cigarettes/day), and the risk of stroke increased with the number of cigarettes smoked; cessation lowered the relative risk ratio to that of a non-smoker.[4] This reduction in risk ratio was significant by two years after stopping and had reached the level of a non-smoker at five years.[4] In a meta-analysis of 32 separate studies, Shinton and Beevers showed that cigarette smoking independently contributed to the incidence of stroke: the greatest risk was of subarachnoid haemorrhage, followed by cerebral infarction.[5]

Heavy smokers have a relative risk of stroke 2-4 times greater than non-smokers.[1 4] The large cohort study of 22 071 US male physicians showed that heavy smokers (>20 cigarettes/day) had a relative risk of total non-fatal stroke of 2.71 and of fatal stroke of 1.46 ($P < 0.05$).[6] The British Regional Heart Study showed a relative risk of of 3.7 in all current smokers.[1]

Howard et al showed increased thickness of the intima-media wall of the carotid artery in smokers compared with non-smokers, particularly among people aged over 60.[7] Differences in mean maximum intima-media wall thickness in the internal carotid artery between current and non-smokers were greater than the change expected over 10 years for a person who has never smoked.[8]

The association between the number of cigarettes smoked and the increase in the risk of stroke remains inconclusive. Some authors suggest a linear relation, particularly in smokers of more than 20 cigarettes a day and older people.[4 6 7-9] A dose-response relation between pack years of smoking and carotid artery disease, measured by increased carotid artery intima-media wall thickness, has been shown.[7 8] An association may exist between passive smoking and intimal hyperplasia, potentially increasing the risk of stroke.[7 10] Although the dose-response relation is unclear, stopping smoking does reduce the incidence of stroke. Both the Framingham Heart Study[4] and the Nurses Health Study[11] showed a normalised risk ratio five years after cessation. Also after five years there was no further benefit.[1] Tell et al, however, showed that risk reduction was dependent on the quantity of cigarettes smoked before stopping: light smokers (<20 cigarettes/day) reverted to normal values, but heavy smokers retained twice the incidence of stroke as non-smokers.[8] Secondary pipe or cigar smokers still have an increased risk similar to that of light smokers,[1] so switching to a pipe or cigars confers little benefit.

Former smokers have a decreased prevalence of clinically significant (>50%) internal carotid artery stenosis (7.3%) than current smokers (9.5%),[8] this difference being greatest in older people.[7] No significant relation exists between carotid artery wall thickness and years since quitting smoking.

The relative risk of stroke among hypertensive smokers is five times that among normotensive smokers, but 20 times that of normotensive non-smokers. Pharmacological treatment of hypertension in mildly hypertensive smokers is much less effective in reducing the incidence of smoke than in mildly hypertensive non-smokers, supporting smoking as a causal agent.[12]

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The greatest benefit in stopping smoking is among hypertensive heavy smokers.[4 7]

Cigarette smoking is thus a definite independent risk factor for stroke, particularly ischaemic stroke. The mechanisms are poorly understood but may be associated with raised fibrinogen levels, increased packed cell volume, decreased macrophage activity, or changes in lipid biochemistry promoting atherosclerosis. The evidence for a causal association between cigarette smoking and extracranial carotid atherosclerosis is abundant. All smokers who stop smoking will benefit from reducing their risk of ischaemic stroke, irrespective of the degree of previous exposure to smoking.

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Psychiatry, stigma, and resistance

Psychiatrists need to concentrate on understanding, not simply compliance

The Royal College of Psychiatrists has just launched a five year campaign aiming to reduce the stigmatisation experienced by people with mental health problems and to close the gap between professional and public assessment of treatment. The campaign is targeted primarily at the general public, whose attitudes differ significantly from those of health professionals.[1 2] The main problem that the campaign seeks to address is the resistance of sufferers to seeking or accepting advice and treatment. It is based on the assumption that this resistance is linked to public attitudes towards treatment of mental problems and the stigma experienced by sufferers.

The campaign literature cites a study by Jorm et al, which shows that the public more often perceives psychiatric medication as harmful than helpful.[2] There are several possible explanations for this. For the general public such questions may well be hypothetical and their replies may reflect a rejection of stigmatising psychiatric diagnoses. The vignettes they were presented with, which most of the professionals in Jorm et al's sample recognised as depression and schizophrenia, may not have been recognisable as such by the public. In any case, the general public has less information about psychiatric disorders than do health professionals. Their preferences for vitamins, tonics, herbal medicines, and relaxation courses may be part of a more general aversion to medicines and a preference for gentler treatments.[3 4] However, none of this necessarily explains the resistance to treatment that troubles the Royal College of Psychiatrists.

To understand this resistance, it is necessary to examine users' experiences. The results of an interview based study of over 500 psychiatric patients give some clear messages.[5 6] Respondents, all of whom had had at least one admission for psychiatric illness, were asked to evaluate various mental health interventions. Their evaluations of treatments were closely linked to the quality of their relationships with psychiatrists. Interventions were preferred when accompanied by a good personal relationship. Even in the case of electroconvulsive therapy, those who felt that psychiatrists had responded to them positively were more likely to view the treatment as helpful. Negative evaluations of major tranquillisers were associated with coercion and the perceived attitudes of psychiatrists. Respondents rejected the use of these drugs if they felt that they had been used as a form of punishment, using terms such as "chemical cosh" and "liquid straitjacket."[6] The use of major tranquillisers was also associated with neglectful and uncaring attitudes. Antidepressants received more positive evaluations than the other drug therapies, and were not linked with perceived negative attitudes of psychiatrists, perhaps because they are often prescribed by general practitioners.

Talking therapies were evaluated most positively, particularly in relation to traditional psychiatry. People valued the fact that they were listened to as individuals, that no value judgments were made, and that they were heard and understood. The results also showed that users who were informed of the theoretical approach used by their therapist were more likely to be satisfied, suggesting that explanation and information are important.

As well as addressing public perceptions of mental illness, psychiatrists also need to look at their own practice. The task of the psychiatrist is much more than making a diagnosis and providing an appropriate label. People with mental illness need help in making sense of their experiences. As in other branches of medicine, appropriate and acceptable treatments need to be built on the foundations of good relationships in

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